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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/778,221	02/06/2001	Doron Burshtein	TI-29681A	5734
7590 05/05/2005			EXAMINER	
Texas Instruments Incorporated P.O. Box 655474 MS 3999 Dallas, TX 75265			ODOM, CURTIS B	
			ART UNIT	PAPER NUMBER
			2634	

DATE MAILED: 05/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/778,221

Applicant(s)

BURSHTEIN ET AL.

Examiner

Curtis B. Odom

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) 4-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 February 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Objections*

1. Claim 11 is objected to because of the following informalities:
  - a. The word “labelling” is suggested to be changed to “labeling”.
  - b. The word “mimimizing” is suggested to be changed to “minimize”.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 101*

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 1 and 2 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 1 and 2 are directed towards QAM constellation which is simply a plurality of signals/symbols. Note a data signal merely consists of “1” and “0” to represent the coded signal. It does not fall under the category of a method, apparatus, product, or composition of matter. The signal falls into the category of Nonfunctional Descriptive Material. See for example MPEP § 2106 IV.B.1. (b) which states that

The policy that precludes the patenting of nonfunctional descriptive material would be easily frustrated if the same descriptive material could be patented when claimed as an article of manufacture. For example, music is commonly sold to consumers in the format of a compact disc. In such cases, the known compact disc acts as nothing more than a carrier for nonfunctional descriptive material. The purely nonfunctional descriptive material cannot alone provide the practical application for the manufacture.

The signal is functionally equivalent to the compact disc in that it is nothing more than a carrier for nonfunctional descriptive material (1's and 0's). The nonfunctional material, or the signal for that fact, cannot alone provide the practical application for the manufacture. Without a communications device, the signal is nonfunctional, it produces or manufactures nothing. Thus, a claim directed toward a signal is deemed non-statutory subject matter.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claim 3 is rejected under 35 U.S.C. 102(e) as being anticipated by Ramaswamy et al. (U.S. Patent No. 5, 740, 203).

Regarding claim 3, Ramaswamy et al. discloses a method for improved shell mapping comprising:

providing (column 10, line 10-column 11, line 48) a non-square grid QAM constellation and employing points of the constellation in the mapping

6. Claim 11 is rejected under 35 U.S.C. 102(e) as being anticipated by Vijayan et al. (U. S. Patent No. 5, 151, 296).

Regarding claim 11, Vijayan et al. discloses a QAM constellation labelling method, comprising:

labeling (column 5, lines 4-65) each point so that the Hamming distance between each neighboring pair is one, and labeling such pairs to minimize the Hamming distance when the distance can not be set to one.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) (with regards to the above 101 rejection) as being unpatentable over Kennard et al. (U. S. Patent No. 4, 855, 692) in view of Paik et al. (U. S. Patent No. 5, 363, 408).

Regarding claims 1 and 2, Kennard et al. discloses generating a QAM constellation, comprising:

arranging (Figs. 1-3, column 4, line 26-column 8, line 47) points in a non-square grid to achieve a large noise margin, wherein points are spaced in the phase plane as far apart as

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possible to provide the greatest SNR ratio, hence an improved noise margin (column 1, lines 34-39); and the points are selected using low word widths (column 4, line 63-column 5, line 64).

Kennard et al. does not specifically disclose the generation of the QAM constellation allows fast convergence of blind equalization algorithms.

However, Paik et al. discloses that the speed of the convergence is based on the error in a received constellation (column 8, line 42-column 9, line 12). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that by spacing points in the phase plane as far apart as possible to provide the greatest SNR ratio, hence improving the noise margin for the constellation, that a received constellation would contain reduced errors, leading to a faster convergence. Thus, claims 1 and 2 do not constitute patentability.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Larioa et al. (U. S. Patent No. 5, 388, 124) discloses shaping constellations to improve performance, such as more reliable data transmission over channels corrupted by additive noise.

Wei (U. S. Patent No. 4, 713, 817) discloses hexagonal shaped QAM constellations.


10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 571-272-3046. The examiner can normally be reached on Monday- Friday, 8-5.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Curtis Odom  
April 26, 2005



**STEPHEN CHIN**  
**SUPERVISORY PATENT EXAMINEE**  
**TECHNOLOGY CENTER 2800**